

WHAT IS CLAIMED IS:

1. A light receiving element for blue rays comprising:
a substrate;

5 a p^+ barrier layer (PBL) buried in the substrate by a designated depth for serving as an anode for receiving a power provided from the exterior;

10 a p-type epitaxial layer formed on the p^+ barrier layer (PBL) by epitaxial growth, and provided with a depletion layer area for generating pairs of electrons-holes (EHP) corresponding to energy of incident light from the exterior;

15 a p^+ well layer formed on designated areas of the p-type epitaxial layer, formed by masking, by injecting a designated impurity in an ion state into the designated areas, and electrically connected to the p^+ barrier layer (PBL);

a polysilicon layer formed by depositing polysilicon on window areas formed by window-etching an oxide layer obtained by oxidizing the p-type epitaxial layer; and

20 an n^+ shallow junction layer diffused into a designated depth of the p-type epitaxial layer by implanting a designated impurity ion into the polysilicon layer and then heating the polysilicon layer for serving as a cathode for transmitting an electrical signal obtained by photoelectric conversion to the exterior.

2. A light receiving element for blue rays comprising:

a substrate;

a p^+ barrier layer (PBL) buried in the substrate by a designated depth for serving as an anode for receiving a power provided from the exterior;

a p-type epitaxial layer formed on the p^+ barrier layer (PBL) by epitaxial growth, and provided with a depletion layer area for generating pairs of electrons-holes (EHP) corresponding to energy of incident light from the exterior;

a p^+ well layer formed on designated areas of the p-type epitaxial layer, formed by masking, by injecting a designated impurity in an ion state into the designated areas, and electrically connected to the p^+ barrier layer (PBL);

a polysilicon layer formed by depositing polysilicon, doped with an impurity ion, on window areas formed by window-etching an oxide layer obtained by oxidizing the p-type epitaxial layer; and

an n^+ shallow junction layer diffused into a designated depth of the p-type epitaxial layer by heating the polysilicon layer for serving as a cathode for transmitting an electrical signal obtained by photoelectric conversion to the exterior.

3. The light receiving element as set forth in claim 1 or 2, wherein:

the polysilicon layer is overlapped with the oxide layer

by a designated distance; and

parts of the polysilicon layer formed on the window areas and the oxide layer are removed by etching after the formation of the n^+ shallow junction layer.

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4. The light receiving element as set forth in claim 1 or 2,

wherein non-removed portions of the polysilicon layer formed on the window areas and the oxide layer serve as external electrodes for receiving a power provided from the exterior.

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5. The light receiving element as set forth in claim 1 or 2,

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wherein the impurity ion-injected into the p^+ well layer is one selected from the group consisting of boron (B) and BF_2 .

6. The light receiving element as set forth in claim 1 or 2,

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wherein the n^+ shallow junction layer has a junction depth of $0.1\mu m$ to $0.2\mu m$.

7. The light receiving element as set forth in claim 1 or 2,

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wherein the impurity ion forming the n^+ shallow junction

layer is one selected from the group consisting of phosphorous (P) and arsenic (As).

8. A method for manufacturing a light receiving element for blue rays comprising the steps of:

(a) forming a p^+ barrier layer (PBL) for serving as an anode for receiving a power provided from the exterior on a substrate;

(b) growing a p-type epitaxial layer, provided with a depletion layer area for generating pairs of electrons-holes (EHP) corresponding to energy of incident light from the exterior, on the p^+ barrier layer (PBL);

(c) forming a p^+ well layer, electrically connected to the p^+ barrier layer (PBL), on the p-type epitaxial layer;

(d) forming an oxide layer by oxidizing the p-type epitaxial layer;

(e) forming a polysilicon layer by depositing polysilicon on overlapped areas between window areas formed by window-etching the oxide layer and the oxide layer by a designated distance;

(f) implanting a designated impurity ion into the polysilicon layer;

(g) forming an n^+ shallow junction layer into a designated depth of the p-type epitaxial layer by heating the polysilicon layer provided with the implanted impurity ion;

and

(h) etching the polysilicon layer formed on the overlapped areas between window areas and the oxide layer by the designated distance.

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9. A method for manufacturing a light receiving element for blue rays comprising the steps of:

(a) forming a p^+ barrier layer (PBL) for serving as an anode for receiving a power provided from the exterior on a substrate;

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(b) growing a p-type epitaxial layer, provided with a depletion layer area for generating pairs of electrons-holes (EHP) corresponding to energy of incident light from the exterior, on the p^+ barrier layer (PBL);

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(c) forming a p^+ well layer, electrically connected to the p^+ barrier layer (PBL), on the p-type epitaxial layer;

(d) forming an oxide layer by oxidizing the p-type epitaxial layer;

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(e) forming a polysilicon layer by depositing polysilicon, doped with an impurity ion, on overlapped areas between window areas formed by window-etching the oxide layer and the oxide layer by a designated distance;

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(f) forming an n^+ shallow junction layer into a designated depth of the p-type epitaxial layer by heating the polysilicon layer doped with the impurity ion; and

(g) etching the polysilicon layer formed on the overlapped areas between window areas and the oxide layer by the designated distance

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10. The method as set forth in claim 8 or 9,

wherein the n^+ shallow junction layer has a junction depth of $0.1\mu m$ to $0.2\mu m$.